# **Machine Leaning to Translate Applicants Work History-Technical Report**

Krishna Kumar Veeraputhiran

Grand Canyon University

DSC 540 – O500 – Machine Learning for Data Science

Dr. Aiman Darwiche

August 11, 2021

# **Machine Leaning to Translate Applicants Work History-Technical Report**

According to Gopal (2019), Information is the greatest power in this modern age. Information can be classified on the basis of nature of experience as experimental data and information from structured human knowledge. In this report, we will discuss on how information about one’s work related past can be translated to predictors to predict their future job outcomes by applying Machine Learning techniques. Here we will summarize the form of learning that has been applied to convert previous work related features to measures that are interpretable to select best candidate for a future job opening (SAJJADIANI ET AL).

The authors used supervised Machine learning techniques on three important predictor variables namely Relevant work experience, Tenure history and attributions of Previous turnover to predict the outcomes like student evaluations, expert observations of performance, student score improvement, voluntary and involuntary turnover.

The supervised learning is used in standardizing the predictors like work experience. As Gopal (2019) has mentioned that Supervised learning is where a machine is designed by understanding a known information (training data) by creating a mapping information between the input variables and the output variables. Later this mapping information is used to predict the outcomes on any new dataset. In case of work experience the supervised learning is used as a classification task to classify the designation according to O\*NET standard. Also for attribution of previous turnover, the authors have used supervised learning where they have trained a small amount of data (3%) to classify the turnovers based on reason for leaving and applied the same on the remaining 97% of data set. The authors also used supervised learning to classify applicants their race and gender. Nearly 37% of the applicants did not mention their race or gender and the authors used a supervised algorithm to train a model which was able to predict the missing race and gender with 95% accuracy.

Based on the variables and their classification (based on supervised learning) the authors were able to infer some common hypothesis. For example, applicants switching jobs for better jobs affect the performance in a positive way and negatively affect the voluntary turnover hazard. Similarly applicants with proper work experience relevance tend to have positive response towards performance and longer tenure and negative impact towards turnover. All these hypothesis were inferred by applying supervised learning which were manually confirmed by the Research assistants research on the applicants’ job application.

**Other Forms of Learning**

There are 14 different types learning that are available for Machine Learning Practitioners. One of the common learning methods mentioned by Bonaccorso, G. (2018) is the Semi-supervised Learning method. This learning tries to solve problem with both labeled and unlabeled data with both clustering and classification tasks. Unlabeled data are dataset that are not tagged with any characteristics, properties or classifications. This learning is used where the training data has very few labeled examples and a larger number of unlabeled examples. The difference between the supervised learning is that, unlike in supervised learning where only data that are labelled can be used whereas semi-supervised uses both. Semi-supervised learning uses the learning tasks like clustering and density estimation, similar to unsupervised learning to create labels for unlabeled data. Once the labels are created then the supervised learning will be used for predictions. There are some empirical assumptions like smoothness, cluster and manifold assumptions to be made while using the semi-supervised learning.

# **References**

Bonaccorso, G. (2018). Mastering machine learning algorithms : Expert techniques to implement popular machine learning algorithms and fine-tune your models. ProQuest Ebook Central <http://ebookcentral.proquest.com.lopes.idm.oclc.org/lib/gcu/detail.action?docID=5405679>

Sajjadiani, S., Sojourner, A. J., Kammeyer-Mueller, J. D., & Mykerezi, E. (2019). Using machine learning to translate applicant work history into predictors of performance and turnover. Journal of Applied Psychology, 104(10), 1207–1225. <https://doi-org.lopes.idm.oclc.org/10.1037/apl0000405>

PEARL, J. (2019). The Seven Tools of Causal Inference, with Reflections on Machine Learning. Communications of the ACM, 62(3), 54–60. <https://doi-org.lopes.idm.oclc.org/10.1145/3241036>

Gopal, M. (2019). *Applied machine learning*. McGraw-Hill Education.